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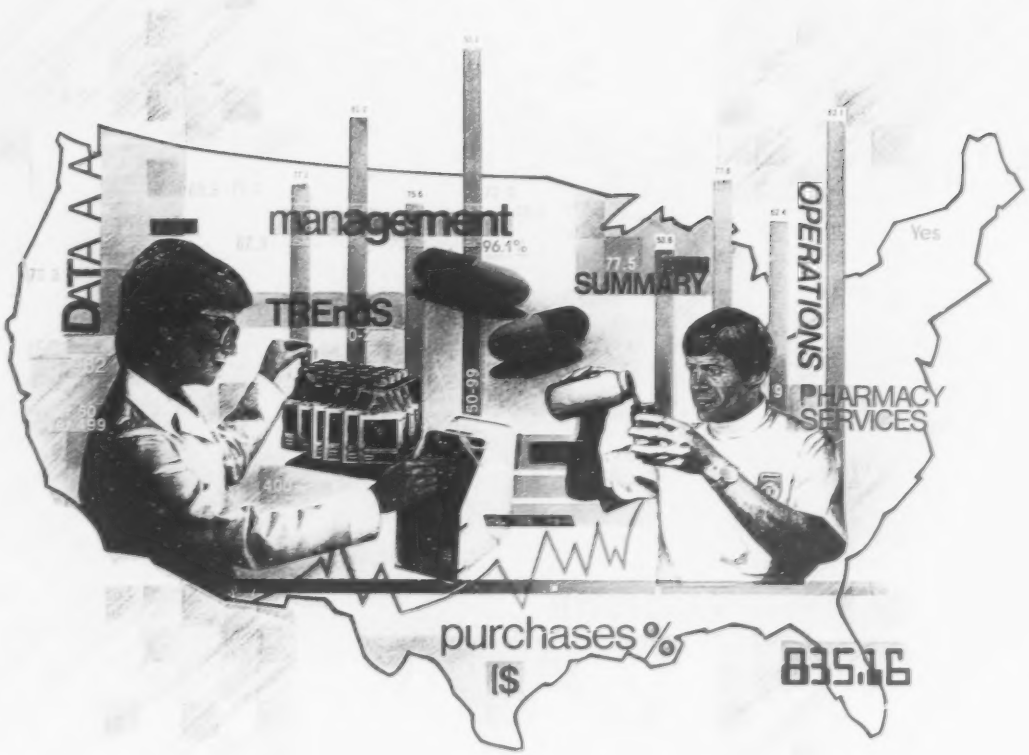
1987



A survey of the 1986 operations of 2,167 hospital pharmacies provided to hospital pharmacy directors in the interest of sound management

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Corporate Mission

Eli Lilly and Company is a research-based corporation that develops, manufactures, and markets human medicines, medical instrument systems, diagnostic products, and agricultural products.

To guide its affairs, the company follows certain fundamental principles. These principles are the following:

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- The company is dedicated to the highest levels of ethics, integrity, and excellence in research, manufacturing, marketing, and all other phases of its operations.
- The company recognizes a primary responsibility to its employees because of the key role employees play in the achievement of corporate goals.
- The company's objective is to attract and retain outstanding people at all levels and in all parts of the organization. It is committed to fair and equitable treatment of all employees and to policies and programs that offer the opportunity for employees to develop meaningful and rewarding careers.
- The company feels an obligation to be a good corporate citizen wherever it operates.

Foreword

For the 11th consecutive year, the LILLY HOSPITAL PHARMACY SURVEY questionnaire was sent to almost 7,000 directors of hospital pharmacies throughout the United States. Responses represented close to 2,200 pharmacies and covered a wide range of information, including financial statistics and personnel requirements. The return rate of over 32% is the highest in LILLY HOSPITAL PHARMACY SURVEY history.

In response to pharmacists' suggestions, the content of the SURVEY has been expanded and provides for the first time the following additional information:

- The number of hospital beds allocated to selected patient services
- Time spent by pharmacists in providing selected pharmacy services
- A more detailed description of outpatient services

Statistics presented in the SURVEY are similar to those in previous issues. The report does not claim to describe optimum hospital pharmacy practice; it simply presents averaged data based on actual operations. No attempt was made to define or structure the sample.

It should be noted that, because not all hospital pharmacists answered every question, some of the charts and tables are based on data from fewer than the total number who responded. In some tabulations, sample sizes were not large enough to be statistically useful, and these are designated as "n.a." (not available).

Eli Lilly and Company is pleased to provide this publication to all who are interested in hospital pharmacy practice. It is hoped that the SURVEY will prove useful to hospital pharmacy managers for both current operations analysis and the planning process.

Table of Contents

1 *CORPORATE MISSION*

2 *FOREWORD*

4 *EXECUTIVE SUMMARY*
Current trends in hospital pharmacy operations

7 *PHARMACY STAFF COMPENSATION*
Average annual payroll for pharmacy department staff components

8 *INVENTORY AND PURCHASES*
Inventory and purchases statistics according to hospital bed size and profile

11 *GEOGRAPHIC SUMMARY*
Selected operating data according to US Department of Commerce regions

12 *PHARMACY SERVICES*
Pharmacy services ranked according to the percentage of total mentions

13 *SATELLITE PHARMACY OPERATIONS*
Satellite pharmacy operating statistics according to hospital bed size and profile

14 *PHARMACY OPERATIONS MANAGEMENT*
Selected operating data tabulated according to hospital profile and bed capacity

16 *CONCLUSION*

17 *COMPARATIVE ANALYSIS WORK SHEET*

19 *PRODUCTIVITY WORK SHEET*

Executive Summary

Selected operating data from 2,167 pharmacies are shown in Table 1. These data profile the "average" hospital pharmacy for the operating year 1986. Because this hypothetical pharmacy is based on information submitted by a broad range of hospitals, the figures may be too general to be used for direct comparison. A comparative analysis work sheet which relies on more detailed information is provided on page 17 for this purpose. However, industry trends can be observed by comparison with average data published in prior issues of the LILLY HOSPITAL PHARMACY SURVEY.

Table 1 shows that the average hospital in 1986 had 235 beds—down almost 4% from the previous year. Census declined slightly, from 60% in 1985 to 59% for 1986. Census has fallen consistently since 1982, when it was 71%. Admissions during 1986 were about 2% lower than in the previous year. The length of patient stay fell to 6.0 days, the shortest period of patient stay ever recorded in the SURVEY. It has declined two full days since 1978. The largest segment of hospitals reporting to the SURVEY continues to be private, nonprofit, general institutions.

The number of hours the central pharmacy was open as well as the hours worked by pharmacists and technicians declined slightly during 1986, although support personnel hours remained essentially unchanged. Overall, the total hours worked by the pharmacy department staff fell over 3%, while the central pharmacy was open about 3% fewer hours. Three hours of pharmacist time were required for each hour the central pharmacy was open during 1986—slightly less than that recorded last year. The ratio of hours worked by technicians to hours open was unchanged at 2.8. Hours worked by support personnel for each hour open increased slightly from 1.1 to 1.2 for the operating year 1986.

For the third time in as many years, the dollar value of inventory declined over the previous year's figure. In addition, purchases were 2% higher, with the result that the estimated inventory turnover rate increased from 8.5 to 8.7 times. It should be noted that, on a per occupied bed basis, inventory and purchases figures were about 5% and 8% higher respectively than in 1985. Had the inventory turnover rate remained at 8.5 times during 1986, inventory investment would have been about $3,000 higher than the 1985 figure. The continuing improvement in the inventory turnover rate observed over the past several years may be the result of an increasing reliance on wholesaler distribution, which results in more efficient stock control that contributes to improved cash flow for these institutions.

Comparison of inventory and purchases data on the basis of patient days indicates that inventory during 1986 equaled $2.38 per patient day (up 11 cents), almost 5% higher than in the previous year. Purchases were $20.82 per patient day, an increase of about 8%. Because inflation is not accounted for separately, its influence on inventory and purchases figures cannot be isolated from the impact of product quantity and mix.

The floor area of the central pharmacy declined just over 5% during 1986. One explanation for this may be a slight shift in distribution of the overall sample over the last two years. It appears that smaller hospitals accounted for a larger share of the total sample during 1986 than in 1985.

Among the ten pharmacy department services listed in the SURVEY, the ranking for the top four was the same for 1986 as for 1985. These four services were offered by over 60% of the responding

Table 1 *Average hospital pharmacy*

	1986 (2,167 Hospitals)	1985 (1,651 Hospitals)	Percent of Change
Bed capacity	235	244	− 3.8%
Class	private nonprofit	private nonprofit	
Profile	general	general	
Census (beds occupied)	59%	60%	
Admissions	8,416	8,566	− 1.8
Patient days	50,607	53,436	
Length of patient stay	6.0 days	6.2 days	
Hours central pharmacy open/week	97	100	− 3.1
Pharmacist hours/week	294 (7.3 FTE)	309 (7.7 FTE)	− 5.1
Technician hours/week	268 (6.7 FTE)	276 (6.9 FTE)	− 3.0
Support personnel hours/week	115 (2.9 FTE)	114 (2.9 FTE)	+ 0.9
Inventory	$120,397	$121,198	− 0.7
	$2.38/patient day	$2.27/patient day	+ 4.8
	$512/bed	$497/bed	+ 3.0
	$868/occupied bed	$828/occupied bed	+ 4.8
	$14.31/admission	$14.15/admission	+ 1.1
Purchases	$1,053,737	$1,032,831	+ 2.0
	$20.82/patient day	$19.33/patient day	+ 7.7
	$4,484/bed	$4,233/bed	+ 5.9
	$7,600/occupied bed	$7,055/occupied bed	+ 7.7
	$125.21/admission	$120.57/admission	+ 3.8
Inventory turnover rate	8.7 times	8.5 times	
Floor area (central pharmacy)	1,712 sq ft	1,799 sq ft	

Services offered by over 60% of pharmacies:			
Monitoring patient profiles	94.4%	Monitoring patient profiles	96.5%
Monitoring drug interactions	91.2	Monitoring drug interactions	92.6
Providing drug information services	74.6	Providing drug information services	82.5
Drug therapy consultation	67.9	Drug therapy consultation	71.2

hospital pharmacies, a decline from the percentage of hospitals reporting these staff activities during 1985.

Review of a decade of selected operating statistics from past editions of the SURVEY reveals the following trends:

- Since 1982, central pharmacy hours open per week increased at a slower rate than during the 1978-1982 period. If the earlier trend had continued, the average hospital pharmacy would have been open well over 100 hours per week during 1986.
- The average number of occupied beds declined dramatically since 1981. Had the earlier trend continued, the occupancy rate would have approached 78% in this issue.
- Inventory and purchases per occupied bed exhibited steady, moderate growth of about 8% annually during the past ten years.
- Pharmacist and technician hours worked each week per occupied bed increased steadily but moderately since 1978. However, pharmacist hours showed a slightly faster rate of growth than did technician hours.

Interestingly, the downtrend for pharmacy hours open and number of occupied beds appears to coincide with the proposal to implement the prospective reimbursement system for Medicare patients during 1981-1982. However, the long-term trend for both inventory and purchases as well as pharmacist and technician hours worked remained unchanged after this period. One explanation for this, suggested by numerous hospital pharmacy practitioners, is that the proportion of beds occupied by acutely ill patients increased during this period. These patients required more intensive therapies and procedures which, in turn, involved more professional time.

The 1986 distribution of SURVEY participants by bed capacities is slightly weighted to the low side when compared with that reported in previous editions of the report. Hospitals with fewer than 200 beds made up 54.3% of the sample. A total of 378 institutions with more than 400 beds accounted for 17.4% of the respondents—lower than the 18.5% recorded for 1985.

According to hospital classification, private, nonprofit facilities again make up the largest reporting segment at almost 62%—down from last year's figure of close to 63%. Government (all except federal) institutions made up approximately 24% of the sample, down almost 1% from the 1985 figure.

Within all classes, the largest percentage of pharmacies included in the 1987 LILLY HOSPITAL PHARMACY SURVEY fall into the general hospital category at about 68% (somewhat higher than the 65.5% figure for the prior year). Specialized facilities account for close to 18% of participants, down considerably from just over 22% recorded for 1985.

Over 92% of hospital pharmacy respondents indicated that physicians could request a nonformulary item—virtually the same percentage as reported in 1985. The responsibility for materials management is among the duties of the pharmacy department staff in close to 23% of reporting hospitals. Of these, seven out of ten staffs are involved with both the purchasing and administrative functions.

Only 125 (5.8%) hospitals reported utilizing outside management organizations to operate the pharmacy. General hospitals accounted for over 86% of this number. Accredited medical resident/intern training programs were offered by approximately one in three respondents. Almost two thirds of the federal facilities and about one third of the private, nonprofit hospitals offered these teaching programs.

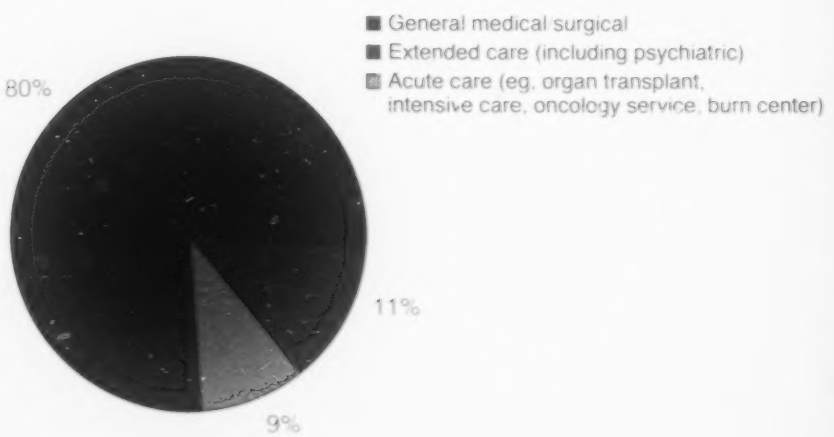
Inquiries concerning computer utilization by hospital pharmacies were expanded somewhat in this year's questionnaire. Overall, the information collected suggests that the use of computers among hospital pharmacists continues to grow. The findings of the study revealed the following:

- Recording of patient profile information was computerized in about 45% of reporting hospitals (up from 38% recorded for 1985 and 29% for 1984).
- Computerized patient billing was reported by almost 58% of participants—up from 57% in 1985.
- Electronic order transmission was computer-assisted in about one in four pharmacy departments during 1986.
- Monitoring of drug movement for inventory control purposes was computerized in approximately 23% of SURVEY hospitals.

With each succeeding edition of the SURVEY, an increased percentage of participating hospital pharmacies employ a full coverage (90% or more of beds served) unit-dose system as their primary means of drug distribution. During 1986, over 84% of hospitals said they used this method. In addition, about 72% indicated they provided full-coverage parenteral admixture services. Of these, 1,011 general and 291 specialized facilities provide both services to their entire patient population (69% and 72% respectively).

Almost 89% of participants said they dispense medication once every 24 hours,

Figure 1 *Average allocation of beds by medical service*



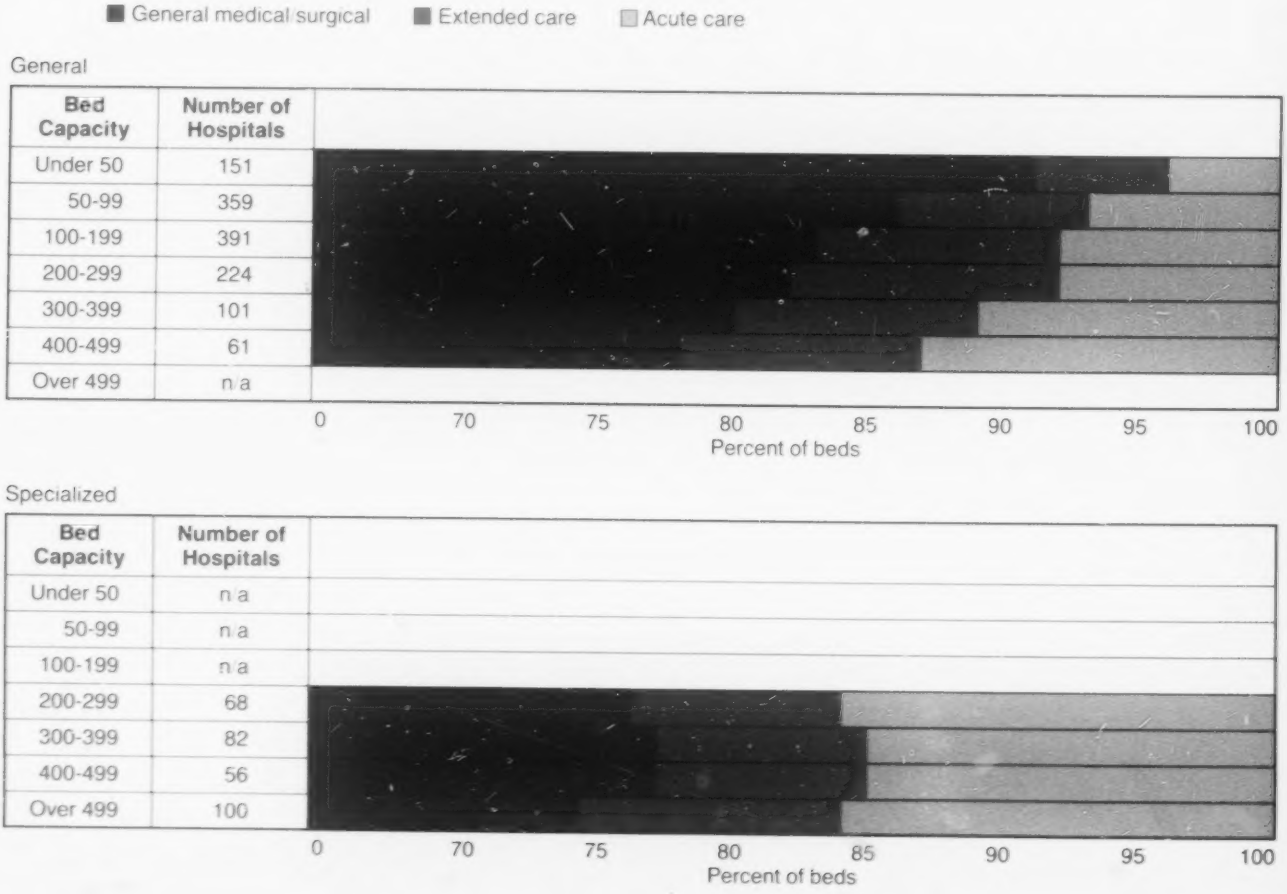
whereas about 10% issue drugs at intervals greater than 24 hours—approximately the same percentages as recorded the previous year. Close to 94% of respondents purchase pharmaceuticals in unit-dose packaging whenever possible—the same figure as that reported for operating year 1985.

Among pharmacies reporting to the SURVEY, about one in five offers 24-hour pharmacy service. Round-the-clock pharmacy service is provided by about 13% of the reporting general hospitals and by over 63% of the specialized institutions. The pharmacist:technician ratio averages close to 1.0:8 among all hospitals who said they offer 24-hour pharmacy service.

Numerous hospital pharmacy managers were interested in knowing what portion of the average hospital's bed capacity was dedicated to various types of medical services. Figure 1 and Chart 1 show the results of this inquiry from responding hospitals. Typically, 80% of bed capacity was devoted to general medical/surgical patient care (Figure 1). An additional 11% of beds were allocated to patients receiving long-term care for psychiatric disorders, chemical dependency, rehabilitation, or other needs that required skilled nursing care. The remaining 9% of bed space accommodated acutely ill patients who require complex diagnostic and/or intensive medical, surgical, or nursing care.

The percentage of beds allocated by medical service according to bed capacity and hospital profile is depicted in Chart 1. As general hospitals increase in size, the allocation of beds for general medical/surgical care declines from 91% in the smallest hospitals to 78% in the largest. However, the share of bed space devoted to acute care services reflects the opposite trend, advancing from 4% to 13% as hospital size increases. Interestingly, general facilities with over 100 beds assigned about 9% of their bed capacity to extended care patients. It is understandable that in larger hospitals, a greater share of available bed space is dedicated to acute care service, since these institutions were probably designed to serve the medical/surgical needs of a wide population which includes more severely ill patients. As Chart 1 shows, the distribution of beds in specialized hospitals remains relatively constant regardless of size. Overall, specialized hospitals with more than 200 beds allocate about 77% of bed space to general medical/surgical care, 8% to extended care, and 15% to acute care. Further analysis of SURVEY data suggests that, among the largest specialized institutions, there is no discernible impact on operating characteristics as the percentage of acute care patient beds increases.

Chart 1 *Allocation of beds by medical service according to hospital size and profile*



Pharmacy Staff Compensation

Average annual payroll for each pharmacy department staff component, total payroll per patient day, and volunteer hours are presented in Table 2. Pharmacist, technician, and support personnel hourly payroll figures can be calculated and are useful for overall comparison and trend analysis. Because these figures are composite values, they cannot be considered for direct comparison with actual individual salaries. This is especially true for pharmacists, since the range between starting staff interns and the director is often substantial.

The pharmacist average hourly rate tends to fluctuate in general hospitals across most bed ranges, whereas technician hourly pay is relatively constant in hospitals with more than 100 beds. Pharmacist and technician hourly payroll in specialized institutions having over 200 beds appears to fluctuate within a relatively narrow range. The pharmacist hourly wage figure tends to be in the $17 to $18 range for both general and specialized hospitals having more than 100 beds, whereas the hourly rate for technicians tends to be in the $7 to $8 range. The support personnel hourly wage figure seems to fall between $6 and $7, with employees in the larger general and specialized hospitals compensated at the higher end of the range.

Pharmacy department payroll expressed on the basis of annual patient days tends to decline as general hospitals increase in size. Among specialized institutions, pharmacy payroll appears to be in the relatively narrow range of $8 to $9 per patient day. According to SURVEY data, about one in four hospitals reported a volunteer work force, and these individuals devoted, on average, about 19 hours per week to the hospital pharmacy department.

Review of SURVEY statistics indicates that staff pharmacists are employed about 2.1 hours per week per occupied bed, whereas the range for technicians is 1.9 hours, the same figures reported for the previous year.

Table 2 shows that, as hospitals increase in bed capacity, so do the number of pharmacist full-time equivalents (FTEs). SURVEY data reveal that, on the average, about 75% of pharmacist time is spent in drug distribution, and the equivalent of one pharmacist is dedicated to clinical practice. Among the largest general hospitals, two pharmacist FTEs are allocated to clinical pharmacy practice, whereas among specialized hospitals with over 500 beds, as many as four pharmacist FTEs are devoted full time to clinical pharmacy duties.

Volunteer hours per week approach one half FTE for most categories. It appears that this level of activity is useful but probably not a major consideration for optimal pharmacy efficiency. In general hospitals, volunteer hours per week tend to rise with increasing bed size. Among specialized facilities, this figure remains relatively constant.

Table 2 *Pharmacy personnel hours and payroll*

General

Bed Capacity	Pharmacist Hours Week	(FTE)	Annual Pharmacist Payroll	Technician Hours Week	Annual Technician Payroll	Support Personnel Hours Week	Annual Support Personnel Payroll	Total Annual Payroll	Payroll per Patient Day	Volunteer Hours/ Week
Under 50	45	(1)	$ 37,445	41	$ 13,411	25	$ 7,704	$ 58,560	$10.54	0
50-99	80	(2)	65,098	68	21,973	38	12,053	99,124	7.86	9
100-199	162	(4)	144,190	135	49,276	67	19,577	213,043	7.68	12
200-299	281	(7)	239,240	230	89,668	70	24,487	353,395	6.52	16
300-399	400	(10)	368,160	357	133,726	102	39,320	541,206	6.79	22
400-499	578	(14)	546,215	483	202,875	130	46,942	796,032	7.38	31
Over 499	828	(21)	731,030	590	246,100	223	88,683	1,065,813	6.21	18

Specialized

Bed Capacity	Pharmacist Hours Week	(FTE)	Annual Pharmacist Payroll	Technician Hours Week	Annual Technician Payroll	Support Personnel Hours Week	Annual Support Personnel Payroll	Total Annual Payroll	Payroll per Patient Day	Volunteer Hours/ Week
Under 50	n a	n a	n a	n a	n a	n a	n a	n a	n a	n a
50-99	n a	n a	n a	n a	n a	n a	n a	n a	n a	n a
100-199	224	(6)	$ 203,210	195	$ 63,091	71	$ 27,549	$ 313,850	$9.13	20
200-299	361	(9)	353,120	293	117,168	102	37,526	507,814	8.50	17
300-399	514	(13)	482,444	416	176,182	123	45,079	703,705	8.33	20
400-499	712	(18)	674,541	589	243,329	166	67,501	985,371	8.65	27
Over 499	1,170	(29)	1,090,433	989	430,066	343	137,127	1,657,626	9.10	27

Inventory and Purchases

Average hospital pharmacy inventory and purchases figures tabulated for general and specialized hospitals are found in Table 3. Because very few specialized institutions reported having fewer than 100 beds, many of the following tables do not contain figures for these lower bed ranges. It is apparent that, as hospital size increases, average inventory and purchases rise. A comparison of 1986 data with figures reported the prior year shows that inventory, purchases, and the inventory turnover ratio tended to increase for most general and specialized hospitals across virtually all bed ranges tabulated.

The estimated inventory turnover ratio generally shows continued improvement in both types of hospitals as bed capacity increases. Specialized institutions have higher turnover ratios as compared with general facilities of similar size. Specialized hospitals also reported higher values for inventory and purchases in every bed range, perhaps because of the broader scope of patient needs that are usually associated with this type of hospital.

Table 4 reflects average inventory and purchases that include IV fluids, irrigation solutions, and blood fractions. It is not surprising that hospital pharmacies stocking these items tend to post higher inventory and purchases figures. Generally, these hospitals, regardless of size or profile, also reported higher inventory and purchases per annual patient day when compared with similar figures from the total sample.

Data on the basis of annual patient days are also recorded in Tables 3 and 4. As expected, for larger hospitals, the number of annual patient days increases. However, figures for inventory per annual patient day in general hospitals tend to decline with increasing size. The ratios tend to increase for specialized hospitals with over 300 beds. Purchases per annual patient day exhibit the same uptrend. Table 3 indicates that, in general institutions, on the other hand, purchases per annual patient day tend to be relatively constant except for a marked drop in the highest bed range.

SURVEY data show that inventory and purchases figures are higher in both general and specialized hospitals of all sizes when medical school faculty are on staff. One explanation for this may be the tendency to involve physicians-in-training in various kinds of diagnostic and medical treatment decisions that require less frequently used products. In specialized hospitals, the impact of having medical school faculty on staff is most evident in those with more than 300 beds. These institutions reported inventory and purchases figures about one third higher than those in facilities of similar size without medical school faculty.

Approximately one in three hospital pharmacy managers said that their inventory and purchases figures included such items as radiographic agents, anesthetic fluids, special diet products, and hyperalimentation materials, which substantially affect the values reported. When SURVEY data are used for comparative purposes, average inventory and purchases figures should be increased by about 20% to compensate for these items if they are a part of normal inventory.

As in the previous SURVEY, two groups of large (over 500 beds) private, non-

Table 3 *Pharmacy inventory and purchases*

General

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
Under 50	$ 24,501	$ 99,585	4.1	5,557	$4.41	$17.92
50-99	43,714	203,953	4.7	12,609	3.47	16.18
100-199	66,192	497,017	7.5	27,730	2.39	17.92
200-299	108,058	942,357	8.7	54,236	1.99	17.38
300-399	152,414	1,398,778	9.2	79,672	1.91	17.56
400-499	207,203	2,027,715	9.8	107,840	1.92	18.80
Over 499	267,306	2,676,865	10.0	171,754	1.56	15.59

Specialized

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
Under 50	n.a	n.a	n.a	n.a	n.a	n.a
50-99	n.a	n.a	n.a	n.a	n.a	n.a
100-199	$ 99,810	$ 874,497	8.8	34,388	$2.90	$25.43
200-299	146,299	1,283,239	8.8	59,741	2.45	21.48
300-399	176,749	1,749,075	9.9	84,439	2.09	20.71
400-499	245,064	2,538,890	10.4	113,887	2.15	22.29
Over 499	451,654	4,720,623	10.5	182,170	2.48	25.91

*Estimated inventory turnover ratio $= \frac{\text{Yearly purchases at cost}}{\text{Average inventory at cost}}$

Figure 2 *Inventory and purchases by wholesaler orientation in large specialized hospitals (over 500 beds)*

	1986		1985	
	Wholesaler Purchases (%)		Wholesaler Purchases (%)	
	Group I	Group II	Group I	Group II
	20%-39%	Over 39%	20%-39%	Over 39%
Median purchases	**30%**	**85%**	**35%**	**80%**
Inventory	$ 679,869	$ 350,753	$ 571,346	$ 352,362
Purchases	$5,845,984	$4,111,852	$4,882,390	$3,712,999
Turnover rate	8.6 times	11.7 times	8.5 times	10.5 times

profit, specialized hospitals were compared to examine the influence of wholesaler purchasing on their annual inventory turnover rate.

Hospitals buying between 20 and 39% (Group I) of their pharmacy department needs from wholesalers reported substantially higher values for both inventory and purchases for 1986 than for 1985; however, their inventory turnover rate rose from 8.5 to 8.6 times, suggesting slightly improved inventory control. This comparison is shown in Figure 2. On the other hand, hospitals that bought more than 39% (Group II) of their pharmaceuticals and related items from wholesalers showed excellent control of inventory investment for the two-year period, even though purchases increased during the year. This resulted in a remarkable inventory turnover rate of 11.7 times per year for these wholesaler-oriented hospitals. Put another way, this group of large, specialized hospitals turned their entire inventory on the average of about once every 30 days during 1986. Pharmacies in this group also recorded significantly lower figures for inventory and purchases than those in Group I. The statistics also indicate that median wholesaler purchases increased from 80% to 85% in the wholesaler-oriented hospitals over the two-year period. This increased reliance on wholesaler distribution suggests that large, specialized institutions favor both the cash-flow benefits of rapid stock turnover and the value-added services provided by prime vendor wholesalers.

About 91% of hospital pharmacies that contributed to the SURVEY are affiliated with cooperative purchasing groups (down from 94% reported for 1985). Among general hospital pharmacies, over 94% said they held membership in cooperative buying organizations. A similar percentage was recorded for specialized institutions. SURVEY data show that over 87% of cooperative members purchase more than one half of their pharmaceuticals and related items through buying groups. Almost 99% buy drugs, and about 76% obtain IV fluids and related accessories through these cooperatives. Non-pharmaceutical items represented close to 10% of pharmacy volume bought through purchasing groups. Only about 6% of buying-group-affiliated hospital pharmacies indicated that their inventory was held and delivered by the purchasing organization (down from about 10% reported in last year's SURVEY).

Table 4 *Pharmacy inventory and purchases that include IV fluids, irrigation solutions, and blood fractions*

General

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
Under 50	$ 27,963	$ 126,001	4.5	6,075	$4.60	$20.74
50-99	45,146	242,032	5.4	12,472	3.62	19.41
100-199	80,158	629,962	7.9	31,051	2.58	20.29
200-299	121,550	1,067,336	8.8	52,626	2.31	20.28
300-399	161,733	1,639,961	10.1	83,135	1.94	19.73
400-499	n/a	n/a	n/a	n/a	n/a	n/a
Over 499	n/a	n/a	n/a	n/a	n/a	n/a

Specialized

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
Under 50	n/a	n/a	n/a	n/a	n/a	n/a
50-99	n/a	n/a	n/a	n/a	n/a	n/a
100-199	n/a	n/a	n/a	n/a	n/a	n/a
200-299	$146,429	$1,489,254	10.2	59,557	$2.46	$25.01
300-399	201,379	2,008,772	10.0	80,393	2.50	24.99
400-499	293,300	2,937,944	10.0	109,803	2.67	26.76
Over 499	569,133	5,731,019	10.1	174,332	3.26	32.87

*Estimated inventory turnover ratio = $\frac{\text{Yearly purchases at cost}}{\text{Average inventory at cost}}$

Hospitals reporting cooperative buying group membership are ranked according to geographic distribution as follows:

Hospital Cooperative Membership

East North Central Region	93.3%
New England Region	92.7%
Pacific Region	92.5%
Middle Atlantic Region	91.5%
East South Central Region	91.2%
Mountain Region	90.8%
West North Central Region	90.7%
South Atlantic Region	88.2%
West South Central Region	86.2%

A comparison with 1985 figures shows that eight of the nine regions posted a lower percentage of buying group membership. Only the New England Region recorded a slight increase in purchasing group affiliation, whereas the West South Central Region reported the largest percentage decrease.

The following tabulation by bed capacity shows the percentage of pharmaceuticals and related items purchased from wholesalers by hospital pharmacies for operating years 1986 and 1985.

Hospital Purchases From Wholesalers

Bed capacity	1986 2,117 Hospitals	1985 1,614 Hospitals
Under 50	88%	80%
50-100	87	80
100-199	83	80
200-299	77	72
300-399	73	70
400-499	68	65
Over 499	55	55
Total	78%	73%

Overall, 78% of pharmaceutical purchases by hospital pharmacies were made from wholesalers during 1986 (up over 20% from the 1983 figure). Worthy of note is that wholesaler purchase percentages increased across virtually all bed ranges when compared with the previous year's figures. This increased use of wholesalers may, in part, be responsible for the continuing improvement in inventory turnover, resulting in a favorable impact on cash flow. Goods obtained from wholesalers during 1986 by hospitals with fewer than 200 beds amounted to over 80% of total pharmaceutical purchases, whereas institutions in the 200- to 500-bed range order, on the average, about three quarters of their needs from wholesalers. The largest hospitals used wholesalers to purchase about one half of their pharmacy stock.

SURVEY data show that profit hospitals order 90% of their pharmacy goods through wholesalers—up from 87% reported for 1985. Private, nonprofit facilities buy 81% of their pharmaceuticals from wholesalers (up from 76%). Government institutions order 71% of their pharmacy stock from wholesalers—3% more than in the previous year. Federal hospitals obtain just 7% of their drug needs from wholesalers—down 3% from last year's figure. The use of depot and contract purchase agreements probably accounts for this low federal figure. Overall, these data suggest a greater reliance on the wholesaler as a provider of the pharmaceutical products required to maintain adequate patient services.

Figures showing the use of a prime vendor wholesaler are tabulated below.

As general hospitals increased in size, there was a slight decline in the use of a prime vendor wholesaler. Among specialized hospital participants, the percentage was relatively consistent until the largest bed ranges. It is interesting, although not surprising, to note that the percentage of hospital pharmacies using a prime vendor wholesaler is slightly higher among general hospitals when compared with that for specialized institutions of similar size. Overall, 87% of general and specialized hospitals used a prime vendor wholesaler to buy drugs and related items.

The proportion of general and specialized hospitals that prepare admixtures for freezing appear below. The percentage tends to increase up to 200 beds and then levels off in the larger bed ranges. The percentage of specialized hospitals that prepare admixtures for freezing is about the same as that for general facilities of similar size. However, a substantial increase in this activity is observed in the largest specialized hospitals. Overall, 17% of LILLY SURVEY respondents said they routinely prepared frozen admixtures.

Hospitals Using Prime Vendors

General

Bed capacity	Pharmacies using prime vendor wholesaler (%)
Under 50	92%
50-99	90
100-199	91
200-299	88
300-399	84
400-499	85
Over 499	n a

Specialized

Bed capacity	
Under 50	n a
50-99	n a
100-199	n a
200-299	80%
300-399	82
400-499	82
Over 499	75

Hospitals Using Frozen Admixtures

General

Bed capacity	Frozen admixtures prepared on routine basis (%)
Under 50	10%
50-99	14
100-199	17
200-299	22
300-399	23
400-499	23
Over 499	n a

Specialized

Bed capacity	
Under 50	n a
50-99	n a
100-199	n a
200-299	21%
300-399	23
400-499	21
Over 499	33

Geographic Summary

Selected operating data arranged according to geographic region are presented in Table 5. For the 11th consecutive year, the Middle Atlantic States reported the highest average bed capacity, census, and pharmacy floor area figures. A possible reason for this may be that more extended care, rehabilitation, and psychiatric facilities seem to be located in this region. Such institutions are generally larger in size, and their patients usually have longer hospital stays. Institutions in the Middle Atlantic States also posted the highest total dollar investment in inventory and purchases among all regions. This may be due in part to the larger size of their hospitals and the higher percentage of beds occupied. However, the Mountain States reported the highest inventory per occupied bed, whereas the West South Central Region had the most purchases per occupied bed. The inventory turnover ratio was highest in the East South Central Region and lowest among hospitals in the New England States.

Compared with the prior year, census was lower in all regions except two—the South Atlantic and Pacific States. Hospital pharmacies in the Middle Atlantic Region occupy the largest space, whereas pharmacy departments in the Mountain States occupy the smallest floor area. Pharmacies operating the longest hours per week were in hospitals in the East North Central States, and those in the New England Region were open the fewest hours. It is worth noting that pharmacy hours open did not increase in any region during 1986.

The average hospital in the Mountain States was the smallest in size, had the lowest census, and remained open the fewest hours. It is not surprising that this region reported the fewest pharmacist and technician hours worked per week. Pharmacist hours per week were highest in the Middle Atlantic States, while pharmacy technician hours were highest among hospitals in the South Atlantic Region. Survey data show that most of the regions that reported a decline in census during 1986 also recorded a decline in pharmacy staff hours worked. In comparison with the prior year's data, it is interesting to note that inventory and purchases increased in five of the nine regions, whereas census increased slightly in only two geographic areas—the South Atlantic and Pacific, which have been associated with the most population growth.

Table 5 *Geographic summary of selected operating data*

Region	Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Percent of Census	Purchases per Occupied Bed	Pharmacy Floor Area (sq ft)	Pharmacy Hours Open	Pharmacist Hours per Week	Technician Hours per Week
New England States CT, MA, ME, NH, RI, VT	218	$109,478	$ 803,949	7.3	67%	$ 5,504	1,581	84	237	213
Middle Atlantic States NJ, NY, PA	315	158,223	1,241,799	7.8	73	5,400	2,070	93	338	232
East North Central States IL, IN, MI, OH, WI	241	115,447	1,063,145	9.2	56	7,877	1,828	102	303	282
West North Central States IA, KS, MN, MO, ND, NE, SD	194	88,669	764,368	8.6	51	7,726	1,433	92	236	208
South Atlantic States DC, DE, FL, GA, MD, NC, SC, VA, WV	261	131,851	1,226,643	9.3	62	7,580	1,868	100	335	382
East South Central States AL, KY, MS, TN	210	107,992	1,017,665	9.4	57	8,502	1,587	96	253	235
West South Central States AR, LA, OK, TX	219	128,265	1,131,738	8.8	51	10,133	1,652	101	300	274
Mountain States AZ, CO, ID, MT, NM, NV UT, WY	134	78,325	631,534	8.1	50	9,426	1,241	91	210	170
Pacific States AK, CA, HI, OR, WA	219	129,366	1,168,538	9.0	58	9,200	1,549	101	322	269
United States Average	235	$120,397	$1,053,737	8.7	59%	$ 7,600	1,712	97	294	268

*Estimated inventory turnover ratio $= \frac{\text{Yearly purchases at cost}}{\text{Average inventory at cost}}$

Pharmacy Services

Hospital pharmacy services offered on a daily basis ranked according to frequency reported are listed in Chart 2. The general ranking was the same for 1986 and 1985. However, eight of the ten services declined in mentions, the second time in the past three years this has occurred. Analysis of several more years of data will be needed before any general conclusions can be drawn concerning the scale of pharmacy services. It should be mentioned that pharmacokinetic service and rounds with physicians were the two activities reported by more hospitals than in the previous year. These services were offered daily by almost one in three hospitals and one in six hospitals respectively.

This year, SURVEY respondents were asked to report the amount of time pharmacists spent in providing selected services to physicians, nurses, and other professionals. Analysis of these data indicates that the majority of hospitals reporting these data were specialized facilities having more than 300 beds. Further review reveals the following:

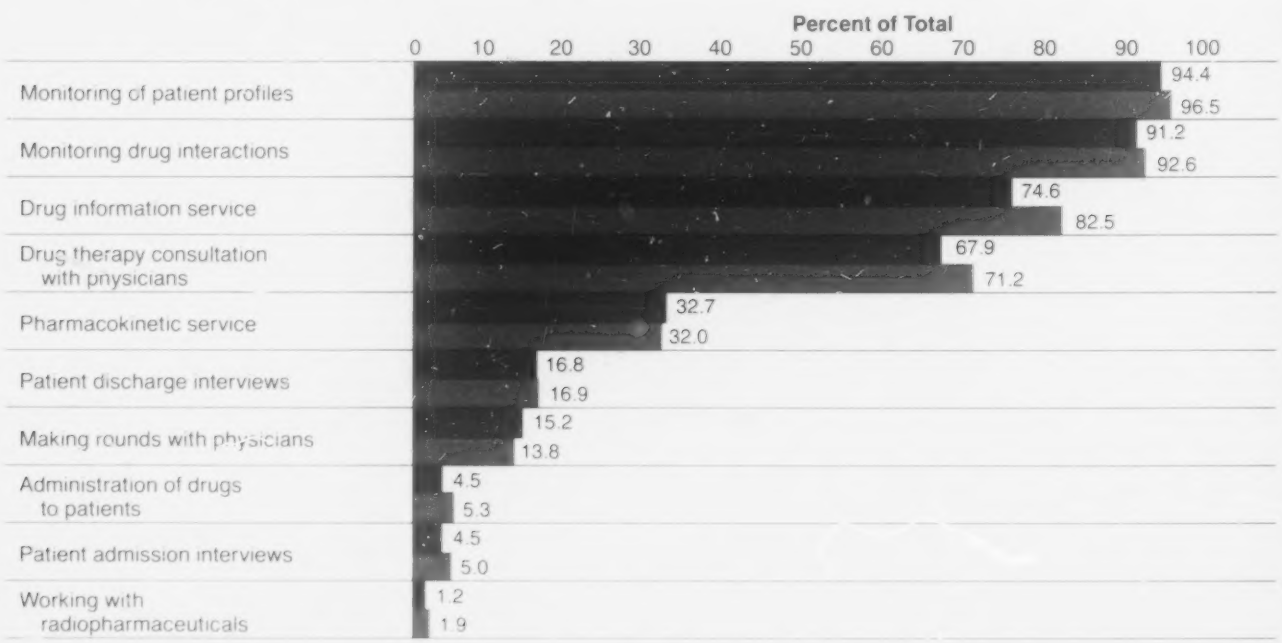
- 8% of responding hospitals said they dedicated one full-time pharmacist to staff the drug information service.
- About 6% of hospitals allocated one pharmacist FTE to consulting about drug therapy.
- 4% of the total sample devoted the equivalent of one pharmacist to providing pharmacokinetic services.
- Only 2% of SURVEY respondents assigned one pharmacist for the exclusive purpose of making regular rounds with physicians.

Hospital pharmacy directors were asked whether specific pharmacy services were routinely part of their departmental responsibility. Review of these data shows that the percentage of hospitals offering these services appears similar for both general and specialized institutions. Comparison with last year's figures indicates that drug utilization review and in-service education as well as responding to CPR attempts expanded among general hospitals. Among specialized facilities, all listed services increased except responding to CPR attempts which declined. Specialized hospitals expanded their regular pharmacy bulletin and training programs for students' activities, whereas general institutions' support of these programs decreased during 1986.

Hospitals Operating Selected Services

Service Available	Percent of Total	
	General	Specialized
Drug utilization review	91.8%	94.6%
In-service education	87.9	92.8
Regular pharmacy bulletin	59.0	83.5
Training programs for students	50.8	77.3
Responding to CPR attempts	35.0	25.2

Chart 2 *Hospitals offering services on daily basis (1986-1985)*



Satellite Pharmacy Operations

Average satellite pharmacy operating data tabulated for general and specialized hospitals are found in Table 6. A total of 329 (15.2%) SURVEY respondents said they operated a satellite pharmacy service. Of these, about 30% are in general hospitals, and over half are in specialized institutions. It is apparent that, as bed capacity grows, the percentage of pharmacies offering satellite pharmacy service also increases, regardless of hospital profile. Interestingly, among general and specialized hospitals with more than 500 beds, about seven in ten offer this service. As satellite pharmacy service expands, it is understandable that there is a tendency for more hours to be worked per week by pharmacists and technicians. The ratio of pharmacist hours worked to satellite hours open appears to remain relatively constant at about 1:1 in general hospitals, and somewhat higher in specialized institutions. However, the ratio of combined hours worked by both pharmacists and technicians to hours open shows an upward trend as size increases for both profiles. The percentage of hospitals operating multiple satellites appears to rise with increasing size, regardless of profile.

Hospitals Operating For-Profit Retail Pharmacies

Class	Bed Capacity		
	Under 200	200 to 350	Over 350
Private, nonprofit	9%	15%	23%
Private, profit	18	39	n.a

Over 13% of SURVEY respondents said they operated retail pharmacy departments on a for-profit basis. The figures above show the breakdown of these operations according to hospital classification and bed range.

The percentage of private, nonprofit hospitals operating as for-profit retail pharmacy operations increases with bed size. The same trend is observed with proprietary institutions; however, it should be noted that the percentage operating for-profit retail pharmacy business is about twice that of similarly sized private, nonprofit hospitals.

Hospital pharmacy directors have indicated that there is more demand to provide home health care services through the outpatient pharmacy department. To provide more specific data about these services, the SURVEY requested selected information. The results of the inquiry show that about 12% of SURVEY respondents offered total parenteral nutrition to outpatients. Home oncology service was provided by 12% of the total sample, and nutrition counseling was offered by 5%. Comprehensive home health care (including total parenteral nutrition, oncology service, and nutrition counseling) was provided by 3% of the total sample. About two thirds of the hospitals offering home health care services were general hospitals with fewer than 350 beds, and close to one third were specialized institutions having more than 350 beds. Among hospitals providing comprehensive home health care services, over half were general, and about one third were specialized.

Table 6 *Satellite pharmacy operations*

General

Bed Capacity	Percent Operating Satellites	Percent of Hospitals Operating Two or More Satellites	Total Hours in Operation	Total Pharmacist Hours/Week	Total Technician Hours/Week
100-199	7%	38%	72	75	76
200-299	17	51	75	95	88
300-399	27	38	89	105	102
400-499	38	56	166	201	186
Over 499	71	65	302	332	326

Specialized

Bed Capacity	Percent Operating Satellites	Percent of Hospitals Operating Two or More Satellites	Total Hours in Operation	Total Pharmacist Hours/Week	Total Technician Hours/Week
100-199	31%	31%	66	111	48
200-299	29	52	108	117	53
300-399	42	61	118	198	180
400-499	58	74	179	243	285
Over 499	71	85	194	375	333

Pharmacy Operations Management

Table 7 shows selected operating figures from both general and specialized hospitals according to bed capacity. As in most tables, the response from specialized hospitals under 100 beds was not sufficiently meaningful. The focus is on data which describe pharmacy department personnel (input) and orders dispensed (output).

The average within each bed capacity range for general and specialized institutions falls about midrange. Annual census, central pharmacy hours open per week, and length-of-patient-stay figures tend to increase as bed capacity rises, regardless of hospital profile. It is not surprising that length of patient stay increases with rising bed capacity, since larger hospitals tend to provide a broader range of services and usually treat more acutely ill patients. Interestingly, the length of patient stay appears to be quite similar in both general and specialized hospitals except for the top bed range. Here, general institutions report over one full day more, probably as a result of more beds devoted to long-term rehabilitation or lengthy psychiatric care.

Among general facilities, pharmacist hours worked per week per occupied bed generally decline as bed capacity increases up to the 200-bed range where it levels off. In specialized institutions, this ratio seems to remain relatively constant as hospitals become larger. However, the figure is significantly higher in specialized hospitals across all bed ranges than in general facilities of similar size. This may be explained, in part, by the expanded patient services offered by specialized institutions. In general hospitals, technician hours worked per week per occupied bed appears to decline as bed capacity increases, whereas in specialized facilities, this ratio fluctuates in a relatively narrow range across most bed ranges. As with pharmacist-hours-per-bed ratios, the comparable numbers for technician hours were higher in specialized hospitals in comparison with similarly sized general institutions. Ratios for support personnel hours per bed tend to remain relatively constant in both general and specialized hospitals having more than 200 beds.

Total staff annual payroll per occupied bed declines steadily in general hospitals until the 300-bed range. This figure tends to be about $2,500 for the larger facilities. The payroll ratio for specialized hospitals appears to fluctuate in a relatively narrow range around $3,200. As previously noted, the higher ratio among specialized hospitals may be explained by the increased professional staff needed to provide additional pharmacy department services.

Average inventory per occupied bed declines as bed capacity goes up in general hospitals. In specialized institutions, this statistic appears to decline until bed capacity exceeds 500. Purchases per occupied bed in general facilities with fewer than 400 beds remain relatively constant at about the $6,500 range. In specialized institutions, purchases per occupied bed fluctuate in the range of about $8,000 across most bed sizes. The largest specialized hospitals post an average pur-

Table 7 *Operations management*

General Hospitals

Operating Statistics	Under 50	50-99	100-199	200-299	300-399	400-499	Over 499
Bed capacity	38	72	137	238	340	438	664
Census (%)	40	46	55	62	63	67	71
Pharmacy hours open week	45	63	90	114	135	144	146
Length of patient stay (days)	4.6	4.7	5.5	6.1	6.5	6.8	8.1
Pharmacist hours week*	3.0	2.4	2.2	1.9	1.9	2.0	1.8
Technician hours week*	2.7	2.1	1.8	1.6	1.7	1.6	1.3
Support personnel hours week*	1.6	1.1	0.9	0.5	0.5	0.4	0.5
Total staff annual payroll*	$3,853	$2,993	$2,827	$2,395	$2,527	$2,713	$2,261
Inventory*	$1,612	$1,320	$ 878	$ 732	$ 712	$ 706	$ 567
Purchases*	$6,552	$6,158	$6,596	$6,386	$6,530	$6,910	$5,678
Nonparenteral orders week*	86	74	76	76	79	68	56
Parenteral orders week*	17	15	14	11	12	11	8
Pharmacy floor area (sq ft)	361	689	1,147	1,913	2,348	3,164	3,883
Orders staff hours worked	14	16	18	22	22	19	18
Productivity indicator (see page 19 for comparative work sheet)	1.14	1.16	1.31	1.57	1.54	1.34	1.26

*Figured on a per-occupied-bed basis.

chases ratio of close to $10,000.

In both general and specialized hospitals, nonparenteral medication order activity per week per occupied bed tends to decline as bed size increases (nonparenteral medication includes unit-dose and multidose inpatient drug orders as well as outpatient prescriptions dispensed). Parenteral medication order activity per week per occupied bed also seems to decline as general hospitals increase in size (parenteral medication includes such items as hyperalimentation preparations, irrigation solutions, large- and small-volume IV admixtures, and reconstitutions). Among specialized hospitals, this parenteral order ratio remains relatively constant. A useful number for comparison can be derived by dividing the sum of all weekly medication orders by the total number of weekly hours of pharmacist, technician, and support personnel. The resulting figure is very general because it does not differentiate between the complexity of various types of orders. Calculations performed for both general and specialized hospitals appear in Table 7. In both types of facilities, medication orders per staff hour tend to increase and peak at 200 to 400 beds before declining.

Productivity indicator figures were calculated and are shown in Table 7. When the productivity indicator is less than 1, pharmacy staff hours are greater than the workload calls for, which suggests possible overstaffing. A figure of 1 indicates that pharmacy staff hours are in balance with the workload. A productivity indicator greater than 1 suggests the pharmacy staff is more productive than usual. Comparison of an individual pharmacy's productivity figures with those of hospitals of similar size and description allows a more realistic evaluation of productivity, since certain efficiencies appear to relate to size.

With increasing bed capacity, the trend of these productivity indicators is very similar to that shown for orders staff hours worked—it rises with increasing bed capacity, peaks at the 200- to 400-bed range, and is followed by a decrease. This may suggest that pharmacists' productivity is somewhat variable; however, pharmacists appear to be able to respond favorably to peak workload situations. It may also suggest that hospitals in the 200 to 400 bed range provide the best setting for pharmacy efficiency. That all the productivity indicators are greater than 1 may suggest that the time values or figures for unit-dose activity may be standardized at too low a level. Regardless of the literal value of each index, the trends across bed ranges and over time are of interest. Comparison of productivity indicators for both general and specialized hospitals for operating years 1984 through 1986 shows an overall decline across virtually all bed ranges, regardless of hospital profile.

It should be noted that the description of unit-dose order activity has been expanded in this year's Survey. Comparison of current figures with previous statistics may be inappropriate. In future editions of the Survey, unit-dose data will be consistent with this year's format. Using the productivity work sheet on page 19, managers can calculate their own pharmacy's productivity indicators and compare them with the productivity indicator figures shown in Table 7.

Table 7 *Operations management*

Specialized Hospitals

Operating Statistics	100-199	200-299	300-399	400-499	Over 499
Bed capacity	151	251	343	444	673
Census (%)	61	65	66	70	72
Pharmacy hours open week	100	133	140	149	164
Length of patient stay (days)	5.7	6.3	6.3	6.6	7.0
Pharmacist hours week*	2.4	2.2	2.3	2.3	2.4
Technician hours week*	2.1	1.8	1.8	1.9	2.0
Support personnel hours week*	0.8	0.6	0.5	0.5	0.7
Total staff annual payroll*	$3,408	$3,113	$3,109	$3,170	$3,421
Inventory*	$1,084	$ 897	$ 781	$ 788	$ 932
Purchases*	$9,495	$7,865	$7,726	$8,169	$9,742
Nonparenteral orders week*	74	78	74	68	65
Parenteral orders week*	13	12	11	12	11
Pharmacy floor area (sq ft)	1,377	2,295	2,750	3,227	4,858
Orders staff hours worked	16	19	18	17	15
Productivity indicator (see page 19 for comparative work sheet)	1.04	1.28	1.26	1.22	1.08

*Figured on a per-occupied-bed basis.

Conclusion

Hospital pharmacy managers continue to focus on cost control, expansion of services, and, most recently, competition within the health care industry. Efforts by pharmacy departments to compete for a larger share of the growing health care market are evident by their activities in new areas, such as home health care and for-profit retail pharmacies. One reason for broadening the scope of patient services may be that hospital administrators are keenly interested in generating revenue from nontraditional sources. This is understandable, since the decline in patient population seen over the past several years appears, in some instances, to have reduced revenue to a point which can jeopardize the institution's future. That many hospitals have found survival difficult in today's economic environment may underscore this premise.

COMPARATIVE ANALYSIS WORK SHEET

If you wish to perform your own analysis, this work sheet may be useful.

It is most useful for both survey comparison and trend analysis to express operating statistics in terms of occupied beds or patient days.

If your pharmacy's operating data are affected by any of the variables that appear beneath each entry, adjust the comparative figure by consulting the appropriate table listed.

1. Hospital profile
   - General ☐
   - Specialized ☐
   - Other ☐
2. Bed capacity _____
3. Census _____ %
4. Beds occupied _____
   (multiply line 2 by line 3)
5. Patient days _____
   (multiply line 4 by 365)
6. Geographic location
   (see Table 5) _____

	Yes	No
7. Unit-dose system (90% of beds)	☐	☐
8. IV admixture service (90% of beds)	☐	☐

Operating Data	1986 Data	1985 Data	SURVEY Data (Comparable Category)
Inventory* (at cost) Use Table 3 for averages and Table 5 to adjust for geographic variation. Refer to Table 4 if inventory includes IV or irrigation solutions or blood fractions. Per occupied bed or patient day	$ _____ $ _____	$ _____ $ _____	$ _____ $ _____
Purchases* (at cost) Use Table 3 for averages and Table 5 to adjust for geographic variation. Refer to Table 4 if purchases include IV or irrigation solutions or blood fractions. Per occupied bed or patient day	$ _____ $ _____	$ _____ $ _____	$ _____ $ _____
Estimated inventory turnover ratio† Use Table 3 for averages.	_____ times	_____ times	_____ times
Pharmacist hours worked per week Use Table 2 for averages.	_____ hours	_____ hours	_____ hours
Technician hours worked per week Use Table 2 for averages.	_____ hours	_____ hours	_____ hours
Pharmacy hours open per week Use Table 7 for averages.	_____ hours	_____ hours	_____ hours
Total annual payroll Use Table 2 for averages.	$ _____	$ _____	$ _____
Pharmacy floor size Use Table 7 for averages.	_____ sq ft	_____ sq ft	_____ sq ft

*Include prescription drugs, IV and irrigation solutions, and blood fractions, if normally in pharmacy's budget.

†Estimated inventory turnover ratio $= \frac{\text{Yearly purchases at cost}}{\text{Average inventory at cost}}$

PRODUCTIVITY WORK SHEET—may be calculated for any time period. However, weekly is indicated on this form.

Pharmacy Workload

Task	Standard Time Value (minutes)	×	Work Units Performed Weekly	=	Total Standard Time (minutes)
Unit dose	2.9	×		=	
Hyperalimentation	37.4	×		=	
Large-volume IV (additives)	6.4	×		=	
Small-volume IV (additives)	7.0	×		=	
Multidose prescriptions (inpatient, outpatient)	9.6	×		=	
Large-volume IV (w/o additives)	2.9	×		=	
				Total	

Total standard workload hours = $\frac{\text{total standard time (minutes)}}{60} = \frac{\qquad}{60} = \qquad$

Pharmacy Staff Hours

Pharmacy staff	Available hours weekly
Pharmacist (drug distribution)	
Pharmacist (management)	
Pharmacist (clinical practice)	
Technician (drug distribution)	
Support personnel	
	Total available hours weekly

Productivity indicator = $\frac{\text{total standard workload hours}}{\text{total available hours}} = \qquad = \qquad$*

*If the productivity indicator is less than 1, there is more pharmacy staff time available than the pharmacy workload requires, and the possibility of overstaffing exists. A productivity indicator figure of 1 suggests that pharmacy staff hours and workload are in balance. When the indicator figure exceeds 1, the pharmacy department is more productive than usual. Refer to Table 7, pages 14 & 15, for comparative indicators.

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A survey of the 1987 operations of 2,248 hospital pharmacies provided to hospital pharmacy directors in the interest of sound management

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TABLE OF CONTENTS

2 CORPORATE MISSION

3 FOREWORD

4 EXECUTIVE SUMMARY
Current trends in hospital pharmacy operations

7 GEOGRAPHIC SUMMARY
Selected hospital pharmacy operating data according to regional distribution

8 PHARMACY OPERATIONS MANAGEMENT
Selected operating data tabulated according to hospital profile and bed capacity

10 INVENTORY AND PURCHASES
Inventory and purchases according to hospital profile and bed capacity

12 PERSONNEL REQUIREMENTS AND PAYROLL
Average annual payroll for pharmacy department staff components

13 PHARMACY SERVICES
Pharmacy services ranked according to the percentage of total mentions

14 FOR-PROFIT AND ANCILLARY OPERATIONS
Outpatient, satellite, and for-profit retail operations data according to bed size and profile

16 CONCLUSION

17 COMPARATIVE ANALYSIS WORK SHEET

19 PRODUCTIVITY WORK SHEET

CORPORATE MISSION

Eli Lilly and Company is a research-based corporation that develops, manufactures, and markets human medicines, medical instrument systems, diagnostic products, and agricultural products.

To guide its affairs, the company follows certain fundamental principles. These principles are the following:

- The company is committed to the discovery and marketing of innovative products of the highest quality that offer benefits to customers in all of our markets.
- The company is dedicated to the highest levels of ethics, integrity, and excellence in research, manufacturing, marketing, and all other phases of its operations.
- The company recognizes a primary responsibility to its employees because of the key role employees play in the achievement of corporate goals.
- The company's objective is to attract and retain outstanding people at all levels and in all parts of the organization. It is committed to fair and equitable treatment of all employees and to policies and programs that offer the opportunity for employees to develop meaningful and rewarding careers.
- The company feels an obligation to be a good corporate citizen wherever it operates.

FOREWORD

Questionnaires sent to almost 6,000 hospital pharmacies yielded 2,248 respondents to this year's LILLY HOSPITAL PHARMACY SURVEY. The findings make up the 1988 SURVEY, the 12th consecutive year the report has been published. This substantial response reflects the continuing interest of hospital pharmacists in the economic information contained in the SURVEY as well as the importance they attach to it as a resource for their management decisions. It is also significant that over 79% of these respondents have participated in the LILLY HOSPITAL PHARMACY SURVEY for two years in a row.

In response to suggestions from pharmacists, two areas were added to this year's SURVEY:

- Hospitals operating for-profit retail pharmacies
- Hospitals operating for-profit home health care businesses

This report does not claim to describe what constitutes optimal or successful hospital pharmacy practice; it merely presents averages derived from actual operations. No attempt has been made to structure or define the sample.

It is important to note that, because not all hospital pharmacists answered every question, some of the charts and tables in the SURVEY are based on data from fewer that the total number who participated. In some tabulations, sample sizes were not large enough to be statistically useful and were omitted.

Eli Lilly and Company is pleased to provide this publication as a service to all who are interested in hospital pharmacy practice. It is hoped that the SURVEY will prove useful to managers of hospital pharmacies for both current operations analysis and for future planning.

EXECUTIVE SUMMARY

Selected operating data from 2,248 pharmacies are tabulated in the 1988 LILLY HOSPITAL PHARMACY SURVEY. Table 1 outlines some key operating data for the "average" hospital pharmacy for the operating year 1987. On page 17 is a work sheet designed for pharmacy directors to organize and analyze their department's statistics.

As shown in Table 1, average bed capacity decreased from 235 to 232 during 1987, a 1.3% decrease and a 5.7% decrease since 1982. Census rose from 59% to 61%, representing the first increase in census during the 1980s. Admissions again showed a significant decrease, falling from 8,416 to 7,404. This 12.1% decrease represents the largest decline in recent years. Patient days increased to over 51,000, reversing a steady downtrend of five years' duration. During 1987, length of patient stay rose almost one full day to 6.9 days, the highest reported by the SURVEY since 1983.

The hours per week the central pharmacy was open as well as the hours worked by pharmacists decreased slightly during 1987. But, technician and support personnel hours rose. It is interesting to note that, if current trends continue, pharmacist full-time equivalents (FTEs) will equal technician FTEs within the next two years. Total manpower hours were up 1.4%, a slower rate of growth than has been reported during recent years.

A substantial increase in inventory was reported for 1987. Inventory increased 25.8% to a record $151,517, and increases were noted across all reporting segments. As a result, inventory per bed rose 27.5% to $653; inventory per occupied bed increased 23.4% to $1,071; inventory per patient day was up 23.1% to $2.93; and inventory per admission increased 43.0% to $20.46.

Purchases were also up from $1,053,737 to $1,217,565, a 15.5% increase. Purchases per bed, per occupied bed, and per patient day also increased. As a result of fewer admissions, purchases per admission rose 31.3% to over $164. This increase in purchases appears to be related to the introduction and increased usage of "high-technology" medicines and immunosuppressive agents.

During 1987, inventory turnover reversed a long-term uptrend and went down to 8.0 from 8.7. Inventory turnover has increased steadily over the past six years, apparently due to the increased use of wholesalers, which results in more efficient stock control that contributes to improved cash flow. Even though purchases from wholesalers increased from 78% to 80% of total pharmacy purchases

Table 1 *Average hospital pharmacy*

	1987 (2,248 Hospitals)	1986 (2,167 Hospitals)	Percent of Change
Bed capacity	232	235	− 1.3%
Class	private nonprofit	private nonprofit	
Profile	general	general	
Census (beds occupied)	61%	59%	
Admissions	7,404	8,416	−12.1
Patient days	51,547	50,607	+ 1.9
Length of patient stay	6.9 days	6.0 days	
Hours central pharmacy open/week	95	97	− 2.1
Pharmacist hours/week	290 (7.2 FTE)	294 (7.3 FTE)	− 1.4
Technician hours/week	274 (6.9 FTE)	268 (6.7 FTE)	+ 2.2
Support personnel hours/week	123 (3.1 FTE)	115 (2.9 FTE)	+ 6.9
Inventory	$151,517	$120,397	+25.8
	$2.93/patient day	$2.38/patient day	+23.1
	$653/bed	$512/bed	+27.5
	$1,071/occupied bed	$868/occupied bed	+23.4
	$20.46/admission	$14.31/admission	+43.0
Purchases	$1,217,565	$1,053,737	+15.5
	$23.62/patient day	$20.82/patient day	+13.5
	$5,248/bed	$4,484/bed	+17.0
	$8,603/occupied bed	$7,600/occupied bed	+13.2
	$164.45/admission	$125.21/admission	+31.3
Inventory turnover rate	8.0 times	8.7 times	
Floor area (central pharmacy)	1,737 sq ft	1,712 sq ft	

Services offered by over 85% of pharmacies:			
Monitoring patient profiles	94.2%	Monitoring patient profiles	94.4%
Drug utilization review	90.6	Drug utilization review	91.8
Monitoring drug interactions	90.3	Monitoring drug interactions	91.2
In-service education	86.7	In-service education	88.5

during 1987, this was evidently not enough to maintain the turnover ratio.

The floor area of the central pharmacy increased about 2% during 1987. A slight shift in reporting hospitals is probably the explanation for this increase. The 1987 sample contained more hospitals in the 200-to-300-bed range than in lower bed capacities, which tended to bring up the average floor area.

Among the 15 pharmacy department services listed in the SURVEY, the top four were ranked the same for both 1987 and 1986. These were, in order: monitoring patient profiles, drug utilization review, monitoring drug interactions, and in-service education. Comparison of 1987 data with 1982 data shows two interesting changes in pharmacy services: Pharmacokinetic services have decreased from 51.4% to 33.6%, and drug utilization review has increased from 70.9% to 90.6%.

It is possible that these 1987 data represent the beginning of a reversal in the trends reported by hospital pharmacies over recent years. Hospitals have now had three or four years of experience with reimbursement based on DRGs as well as HMO programs. The adjustment to these by hospitals seems to have been characterized by shorter patient stays. Now it seems that many patients are admitted or readmitted who are more acutely ill or require more specialized attention and, as a result, involve more therapy and longer stays. Hospitals are aware of new high-technology therapies and how these pharmaceuticals contribute to the quality of care afforded seriously ill patients. Directors have suggested that the use of these new and advanced treatments and their impact on pharmacy budgets should be viewed in this light.

Hospital Data

Nonprofit hospitals made up the largest portion of those reporting, almost 60%—about the same as represented in the 1987 SURVEY. Government (excluding federal) institutions accounted for 25%, federal institutions 3%, and profit hospitals 12% of all respondents.

Fully two thirds of the hospitals in the SURVEY were general hospitals. Specialized facilities constituted 21% (up from 18%), psychiatric 6%, and others 7%. About 32% of all hospitals reported a teaching program for physicians in conjunction with a medical school. Most of the federal institutions reported such a program.

Over 6% of hospital pharmacists, primarily in general hospitals with fewer than 100 beds, reported pharmacies were operated by outside firms. The responsibility for materials management belongs to the pharmacy staff in one of every four reporting hospitals, most of which are involved with both the purchasing and administrative functions. Over 90% of pharmacists in the SURVEY indicated that a physician could request a nonformulary item.

Hospital pharmacists preferred unit-dose packaging as their primary means of drug distribution, with 83% indicating they used it for a full-coverage (90% or more beds served) distribution system. Of those pharmacists using a unit-dose system, 86% supply medication at 24-hour intervals, and 93% buy unit-dose packages whenever they can.

Among hospital pharmacists reporting to the SURVEY, 84% indicated they had a parenteral admixture program in place. About 70% indicated having a full-coverage (90% or more beds served) admixture system.

The dedication of beds to various types of medical services did not change from 1986 to 1987. Table 2 shows that about 80% of hospital beds were used to provide general medical and surgical care, and about 11% were allocated to long-term care, which

Table 2 *Allocation of beds according to hospital size and profile*

General

	Number of Hospitals	General Medical/Surgical (%)	Extended Care (%)	Acute Care (%)
Under 50	225	88	6	6
50-99	388	84	8	8
100-199	458	81	11	8
200-299	243	79	11	10
300-399	109	77	11	12
400-499	54	79	11	10
Over 499	26	64	24	12

Specialized

Under 199	74	75	7	18
200-299	106	76	10	14
300-399	101	71	11	18
400-499	76	74	10	16
Over 499	123	72	12	16

includes addiction recovery and psychiatric units. Acute and intensive care beds made up about 9% of available beds and provided care for patients requiring extensive testing and monitoring.

With increasing size, the proportion of beds allotted to extended and acute care increases in general hospitals. Larger general hospitals seem to diversify care to reflect demand. Specialized hospitals, however, tend to show a more stable bed mix and do not vary significantly as bed capacity rises.

The number of hospitals providing data to the SURVEY this year increased by about 5%. Table 3 represents the distribution by bed capacity of the hospitals that participated in this SURVEY edition. The census of hospitals in the US shows that the LILLY HOSPITAL PHARMACY SURVEY tends toward larger institutions. However, the SURVEY distribution very closely matches the distribution of a randomly selected sample used in an inventory study recently published in the AMERICAN JOURNAL OF HOSPITAL PHARMACY.

Many pharmacy directors have requested that SURVEY data be expressed in terms of patient days, as shown in Table 4. In both general and specialized hospitals, inventory per patient day generally decreases with rising patient days. Purchases, however, tend to stabilize with increasing patient days. Hours open, as expected, increased as patient days increased. Specialized hospitals generally required more pharmacists and technicians as patient days increased.

Pharmacy hours open per week rose as patient days increased for both general and specialized hospitals. Pharmacist and technician hours also rose, as expected, but total staff payroll per patient day decreased substantially for both general and specialized hospitals. It is interesting that the pharmacist-technician ratio is about 1.25 to 1 for almost every category. The number of pharmacist hours per admission shows that general hospitals average about 2 hours and specialized operations about 2 hours and 15 minutes per patient, perhaps reflecting increased preparation time for more complex pharmaceuticals.

Table 3 *Distribution of hospitals according to number of beds*

	Under 200 beds	200-399 beds	Over 399 beds
US[1]	3,962 (70%)	1,189 (21%)	527 (9%)
ASHP[2]	332 (54%)	185 (30%)	100 (16%)
Lilly Hospital Pharmacy Survey	1,254 (56%)	619 (27%)	375 (17%)

[1] American Hospital Association.
[2] Stolar MH: National inventory of hospital pharmaceutical services, 1987. *Am J Hosp Pharm* 1988;45:801-818.

Table 4 *Pharmacy operating data by annual patient days*

General

Patient Days	Average Patient Days	Admissions	Inventory per Patient Day	Purchases per Patient Day	Total Staff Payroll per Patient Day	Pharmacy Hours Open/ Week	Pharmacist Hours/ Week	Technician Hours/ Week
Under 15,000	8,156	1,776	$4.12	$24.89	$12.14	58	71	56
15,000-29,999	22,020	3,889	3.20	19.09	9.48	82	139	106
30,000-59,999	42,225	6,016	2.28	18.40	6.78	101	232	183
60,000-99,999	75,108	10,237	2.80	19.71	6.31	119	392	294
100,000-129,999	113,024	13,274	2.25	15.64	4.81	143	586	479
Over 129,999	179,137	20,827	1.44	18.39	5.30	135	778	727

Specialized

Patient Days	Average Patient Days	Admissions	Inventory per Patient Day	Purchases per Patient Day	Total Staff Payroll per Patient Day	Pharmacy Hours Open/ Week	Pharmacist Hours/ Week	Technician Hours/ Week
Under 30,000	16,724	5,375	$4.25	$38.37	$14.25	87	189	155
30,000-59,999	46,246	7,586	2.73	24.48	8.95	118	326	231
60,000-99,999	78,634	11,842	2.18	25.03	8.30	142	514	412
100,000-129,999	114,500	15,486	2.17	25.43	8.15	151	735	579
Over 129,999	189,593	25,135	2.13	25.72	7.72	153	1,091	862

GEOGRAPHIC SUMMARY

Selected operating data are presented in Table 5 according to geographic region. Compared with the prior year, the census in each region either increased or stayed the same. The Middle Atlantic States showed an increase of five percentage points, going from 73% in 1986 to 78%.

The Pacific Region was the only region to show a decrease in purchases per occupied bed. Inventory, too, decreased.

The percentage of purchases from wholesalers generally increased during 1987. The New England States, Middle Atlantic States, East North Central States, and Pacific States all increased wholesaler purchases by three percentage points or more.

Since all regions reported an increase in census during 1987, it is interesting to note that, generally, there was a decrease in pharmacy hours open and pharmacist hours worked per week and an increase in technician hours worked. The New England States continued to be open the fewest hours of any region and to be staffed with the fewest pharmacists (6 FTEs). Conversely, the East North Central Region was open the most hours and was staffed with the most pharmacists (8.5 FTEs). Pharmacist hourly wage was reported to be highest in the Pacific States. The lowest was reported in the West North Central Region.

Table 5 *Geographic summary of selected operating data*

Region	Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Census	Purchases per Occupied Bed	Percent Purchased Through Wholesaler	Pharmacy Hours Open	Pharmacist Hours/ Week	Technician Hours/ Week	Pharmacist Hourly Wage*
New England States CT, MA, ME, NH, RI, VT	222	$101,719	$ 921,816	9.1	69%	$ 6,017	78%	82	241	244	$16.97
Middle Atlantic States NJ, NY, PA	299	172,531	1,498,504	8.7	78	6,426	72	92	319	229	17.53
East North Central States IL, IN, MI, OH, WI	244	176,068	1,244,038	7.1	57	8,945	82	102	339	302	17.10
West North Central States IA, KS, MN, MO, ND, NE, SD	185	94,830	916,332	9.7	52	9,525	85	90	240	224	16.71
South Atlantic States DC, DE, FL, GA, MD, NC, SC, VA, WV	263	129,485	1,504,108	11.6	64	8,937	78	102	319	375	18.65
East South Central States AL, KY, MS, TN	211	97,088	1,052,777	10.8	57	8,751	82	91	234	255	17.11
West South Central States AR, LA, OK, TX	187	112,965	1,091,658	9.7	53	11,016	82	88	242	242	21.58
Mountain States AZ, CO, ID, MT, NM, NV UT, WY	163	95,334	886,559	9.3	54	10,075	83	100	263	183	18.10
Pacific States AK, CA, HI, OR, WA	220	121,564	1,134,065	9.3	61	8,451	82	94	285	266	23.07
United States Average	232	151,517	1,217,565	8.0	61	8,603	80	95	290	274	18.42

*Estimated inventory turnover ratio = $\frac{\text{Yearly purchases at cost}}{\text{Average inventory at cost}}$

*All pharmacists, including directors.

PHARMACY OPERATIONS MANAGEMENT

The data in Table 6 reflect productivity of pharmacy staffs according to hospital size. These data provide benchmarks with which directors can compare and evaluate departmental data.

The average bed capacity falls about in the middle of each range for general and specialized institutions, with the largest category averaging about 680 beds. Annual census, pharmacy hours open per week, and length-of-patient-stay figures tend to increase with rising bed capacity, regardless of profile. Larger hospitals tend to provide broader services and are more likely to have long-term-care units (eg, psychiatric, skilled nursing). Pharmacy hours open per week tend to be slightly higher for specialized hospitals when compared with general hospitals.

One indication of pharmacy staffing is personnel hours worked per occupied bed. Among general hospitals, pharmacist hours worked per week per occupied bed generally decline with increasing size. In specialized institutions, this figure remains relatively constant across all bed ranges. In general as well as specialized hospitals, technician hours worked per week per occupied bed appear to remain constant in institutions with more than 100 beds, although pharmacies in specialized hospitals show a slightly higher figure. Support personnel hours per occupied bed also tend to be relatively constant in hospitals with more than 100 beds, with most pharmacies showing one half hour of support personnel time worked per week per occupied bed.

Total annual staff payroll declines slightly as bed capacity increases in general hospitals. Specialized hospitals with over 200 beds reflect relatively the same dollar expenditure alloted to staffing—about $2,200.

Pharmacy inventory per occupied bed declines significantly in general hospitals as bed size increases. This steady downtrend underscores the economies of scale associated with larger institutions. It has been suggested by pharmacists in larger specialized institutions that increased usage of anticlotting and immunosuppressive agents during 1987 tended to increase inventory levels over the prior year. Purchases per occupied bed in general hospital categories over 50 beds remain relatively constant. The same can be said for specialized hospitals in the 200-to-500 bed range.

In both general and specialized hospitals, nonparenteral orders per week per occupied bed tend to decline as bed size increases (such nonparenteral medications include both unit-dose and multidose inpatient and outpatient prescriptions dispensed). Parenteral orders per week per occupied bed also seem to decline as general hospitals increase in size (such parenteral medications include hyperalimentation preparations, irrigation solutions, large- and small-volume IV admixtures, and reconstitutions). Among general and specialized hospitals with over 200 beds, parenteral orders remain relatively constant.

Productivity indicator figures were calculated and are also shown in Table 6. When the productivity indicator is less than 1, pharmacy staff hours are greater than the workload calls for, which suggests overstaffing. An indicator of 1 means that pharmacy staff hours are in balance with the workload. A productivity indicator greater than 1 suggests that the pharmacy staff is more productive than usual. Comparison of individual pharmacy productivity figures with those of hospitals of similiar size and profile yields a more realistic evaluation of productivity, since certain efficiencies appear related to size.

Pharmacies that operate in 200-to-500 bed hospitals continue to provide the best setting for staff productivity. Regardless of the value of the indicator, the trends across bed ranges and over time are of interest.

Future editions of the SURVEY will include antineoplastic agents in the Productivity Work Sheet. Preparation of these medications is very time consuming and has not been measured previously in the SURVEY. Using the work sheet on page 19, managers may calculate their own pharmacy's productivity indicators and compare them with the productivity indicators shown in Table 6 and their own ratios from prior years.

It should be noted that pharmacy directors continue to turn inventories up to 12 times a year in the face of rapidly changing item mixes. This may be due to the ready availability of velocity reports provided by wholesalers and management's use of these data. It has been said that the shift by pharmacies to wholesale distribution and the value-added services prime vendors offer may be the single most important contribution to pharmacy efficiency during this decade. Table 6 shows that the central pharmacy area increased with bed capacity. It does not, however, show an often overlooked benefit of wholesaler distribution and the consequent reduction of pharmacy inventory—the freeing-up of storage space for other uses. This has been reported to be as high as 25% of a pharmacy's storage space. Because room is so limited in most hospitals, this new-found area has enabled the set-up of pharmacy services such as a drug information library that simply had no home before.

Table 6 *Operations management*

General

Operating Statistics	Under 50	50-99	100-199	200-299	300-399	400-499	Over 499
Average bed capacity	37	73	138	239	342	441	682
Census (%)	33	42	55	61	62	67	68
Central pharmacy hours open/week	47	65	88	115	130	147	140
Length of patient stay (days)	4.4	5.2	5.8	6.5	6.7	6.6	8.4
Pharmacist hours/week*	3.6	2.6	2.2	2.0	2.1	1.9	2.2
Technician hours/week*	2.2	2.9	1.8	1.6	1.9	2.5	1.7
Support personnel hours/week*	1.6	1.2	0.7	0.5	0.5	0.5	0.5
Total annual staff payroll*	$6,020	$2,390	$2,130	$1,608	$1,950	$1,709	$2,166
Inventory*	$2,770	$1,308	$1,275	$1,064	$ 740	$ 707	$ 704
Purchases*	$15,699	$8,211	$8,229	$9,090	$8,284	$8,024	$8,298
Nonparenteral orders/week*	77	71	79	91	86	99	44
Parenteral orders/week*	17	17	12	12	12	11	7
Central pharmacy floor area (sq ft)	380	624	1,116	1,775	2,468	3,063	3,527
Orders/staff hours worked	13	13	19	25	22	22	12
Productivity indicator (see page 19 for comparative work sheet)	1.00	0.98	1.01	1.01	1.17	1.23	1.08

*Figured on a per-occupied-bed basis.

Table 6 *Operations management*

Specialized

Operating Statistics	200-299	300-399	400-499	Over 499
Average bed capacity	244	342	440	684
Census (%)	65	66	68	71
Central pharmacy hours open/week	126	138	148	163
Length of patient stay (days)	6.2	6.1	6.5	6.6
Pharmacist hours/week*	2.4	2.6	2.3	2.4
Technician hours/week*	2.1	2.2	1.9	2.2
Support personnel hours/week*	0.5	1.0	0.6	0.8
Total annual staff payroll*	$2,122	$2,301	$2,192	$ 2,181
Inventory*	$ 841	$ 867	$ 814	$ 833
Purchases*	$8,198	$9,654	$8,942	$10,213
Nonparenteral orders/week*	76	72	66	53
Parenteral orders/week*	12	12	12	11
Central pharmacy floor area (sq ft)	1,926	2,932	3,146	4,759
Orders/staff hours worked	18	14	16	12
Productivity indicator (see page 19 for comparative work sheet)	1.26	1.16	1.28	1.27

*Figured on a per-occupied-bed basis.

INVENTORY AND PURCHASES

Purchases from wholesalers generally increased during 1987, as shown in Table 7. During the last several years, the prime vendor concept seems to have been accepted by pharmacy directors. The 200-to-500 bed range includes about half of the hospitals surveyed but accounts for the bulk of purchases from wholesalers. It is estimated that, during 1987, over $5.5 billion in pharmaceutical merchandise was purchased from wholesalers by hospital pharmacies. Hospitals with over 200 beds account for about 80% of these purchases.

Table 8 shows that well over 90% of all hospitals surveyed belong to a buying group, which continues a long-term trend. However, pharmacy directors show a varying degree of commitment to such groups. General hospitals usually purchase 40% to 60% of their pharmaceutical needs by making use of group purchase contracts. As hospitals become larger, the tendency to use group purchasing decreases.

Tables 9 and 10 show pharmacy inventory and purchases according to hospital bed capacity. One of the most interesting trends in this year's SURVEY is the increase in inventory and purchases when compared with the prior year's figures. Purchases in general hospitals were up substantially over what they were in 1986, although specialized hospitals showed more modest gains.

As expected, specialized hospitals had higher purchases per annual patient day, perhaps because more complex procedures which require more sophisticated pharmaceuticals are performed in this type of hospital. Inventory per annual patient day in specialized hospitals with over 499 beds showed a substantial increase over the prior year's figure, which may reflect the addition of these "high-technology" pharmaceuticals.

Table 7 *Hospital pharmacy purchases from wholesalers*

Bed Capacity	1987 2,180 Hospitals	1986 2,117 Hospitals
Under 50	85%	88%
50-100	87	87
100-199	85	83
200-299	80	77
300-399	77	73
400-499	72	68
Over 499	58	55
Total	80%	78%

Table 10 reflects inventory and purchases that included IV fluids, irrigation solutions, and blood fractions. It is not surprising that hospital pharmacies stocking these items tend to post higher inventory and purchases figures. Generally, these hospitals, regardless of size and profile, also reported higher inventory and purchases per annual patient day as compared with similar figures for the total sample. Directors of pharmacy indicated that they added some newer classes of medication during 1987. Cardiac medications, radiographic agents, anesthetic fluids, and special diet products all contributed to increased purchases and inventories for hospitals included in this 1988 SURVEY.

Table 8 *Participation in cooperative purchasing groups*

General

Bed Capacity	Hospital Membership	Purchased More Than 75%
Under 99	93%	57%
100-199	96	55
200-299	97	49
300-399	93	59
400-499	93	40
Over 499	88	48

Specialized

Bed Capacity	Hospital Membership	Purchased More Than 75%
Under 99	99%	50%
100-199	94	67
200-299	93	53
300-399	94	57
400-499	91	64
Over 499	90	52

Table 9 *Pharmacy inventory and purchases*

General

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
Under 50	$ 33,788	$ 191,533	5.7	6,154	$5.49	$31.12
50-99	40,162	252,062	6.3	12,214	3.29	20.64
100-199	96,772	624,569	6.5	29,090	3.33	21.47
200-299	170,330	1,470,387	8.6	55,337	3.08	26.57
300-399	157,051	1,756,219	11.2	77,441	2.03	22.68
400-499	209,031	2,370,876	11.3	117,052	1.79	20.25
Over 499	346,714	4,260,694	12.3	176,593	1.96	24.13

Specialized

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
100-199	$ 95,172	$ 894,208	9.4	30,843	$3.09	$28.99
200-299	133,374	1,300,132	9.7	64,962	2.05	20.01
300-399	195,594	2,178,852	11.1	82,963	2.36	26.26
400-499	243,486	2,675,315	11.0	115,017	2.12	23.26
Over 499	693,966	5,131,293	12.2	171,525	2.40	29.42

*Estimated inventory turnover ratio = $\frac{\text{Yearly purchases at cost}}{\text{Average inventory at cost}}$

Table 10 *Pharmacy inventory and purchases that include IV fluids, irrigation solutions, and blood fractions*

General

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
50-99	$ 39,508	$ 269,700	6.8	12,787	$3.09	$21.09
100-199	84,779	622,100	7.3	28,236	3.00	22.03
200-299	169,803	1,152,287	6.8	50,831	3.34	22.67
300-399	188,223	2,341,916	12.4	80,624	2.34	29.05

Specialized

Bed Capacity	Inventory	Purchases	Inventory Turnover Ratio*	Annual Patient Days	Inventory per Annual Patient Day	Purchases per Annual Patient Day
200-299	$140,032	$1,413,754	10.1	58,203	$2.41	$24.29
300-399	200,693	2,248,415	11.2	78,003	2.57	28.82
400-499	255,019	3,083,736	12.1	110,944	2.30	27.80

*Estimated inventory turnover ratio = $\frac{\text{Yearly purchases at cost}}{\text{Average inventory at cost}}$

PERSONNEL REQUIREMENTS AND PAYROLL

Table 11 presents a breakdown of pharmacy personnel and payroll requirements for hospitals of various size. Because these figures are composite values, they should not be considered for direct comparison with actual individual salaries. This is especially true for pharmacists, since the range between starting staff pharmacists and senior directors is often substantial. Annual payroll for each pharmacy staff component, payroll per patient day, and volunteer hours worked are important areas for managers to evaluate.

The average hourly rate for pharmacists tends to remain relatively steady across all bed ranges and hospital profiles at about $18. Technicians' wages varied more but approximated $7.50. One trend noticed is that specialized hospitals paid technicians a higher wage across all bed capacities surveyed, which may reflect more complex job criteria for a technician in this setting.

Support personnel were utilized to a greater extent in specialized hospitals. Overall, support personnel hours and payroll were higher when compared to previous years. Pharmacy directors have indicated that utilization of support personnel has increased and that their tasks have been expanded.

Total annual payroll for the pharmacy department increased in both general and specialized institutions. General hospitals increased more, with hospital pharmacies in the larger bed capacities gaining the most.

Generally, payroll per patient day remained the same during 1987. This may reflect an ability to adjust staffing during peak and slow periods. Many directors have indicated that split-shifts helped maximize productivity.

SURVEY data reveal that, on the average, about 71% of pharmacist time per week is spent in drug distribution and about 13% in clinical practice. Among the larger general hospitals, about 80 hours per week (2 FTEs) are allocated to clinical practice, whereas in the larger specialized hospitals up to four pharmacists are so engaged.

The SURVEY collects data on all pharmacists employed by hospital pharmacies and does not differentiate between director, clinical, and staff pharmacist. When making comparisons with data in Table 11, institutions with extensive clinical services requiring more pharmacist specialization may find their overall payroll for pharmacists to be slightly higher.

Table 11 *Pharmacy personnel hours and payroll*

General

Bed Capacity	Pharmacist Hours/Week	(FTE)	Annual Pharmacist Payroll	Technician Hours/Week	Annual Technician Payroll	Support Personnel Hours/Week	Annual Support Personnel Payroll	Total Annual Payroll	Payroll per Patient Day	Volunteer Hours/ Week
Under 50	44	(1)	$ 43,448	63	$ 8,694	44	$ 9,507	$ 61,759	$10.03	2
50-99	81	(2)	73,386	90	28,264	38	11,140	112,790	9.24	11
100-199	164	(4)	161,694	144	55,037	56	23,397	240,128	8.25	13
200-299	294	(7)	271,089	237	97,218	79	24,401	392,708	7.10	17
300-399	445	(11)	413,295	400	162,878	107	37,058	613,231	7.92	21
400-499	568	(14)	505,012	746	230,960	163	48,134	784,106	6.70	32
Over 499	1,005	(25)	1,004,697	796	312,060	248	49,656	1,366,413	7.74	24

Specialized

Bed Capacity	Pharmacist Hours/Week	(FTE)	Annual Pharmacist Payroll	Technician Hours/Week	Annual Technician Payroll	Support Personnel Hours/Week	Annual Support Personnel Payroll	Total Annual Payroll	Payroll per Patient Day	Volunteer Hours/ Week
100-199	221	(6)	$ 214,489	178	$ 78,917	68	$24,267	$ 317,673	$10.30	19
200-299	376	(9)	336,549	325	120,996	81	30,787	488,332	7.52	20
300-399	582	(15)	519,346	506	194,699	135	46,989	761,034	9.18	22
400-499	678	(17)	655,913	581	230,199	173	49,058	935,170	8.14	27
Over 499	1,146	(29)	1,058,869	1,089	487,671	371	68,691	1,615,231	9.42	26

Table 12 *Services offered by hospital pharmacies (1987 and 1986)*

	1987	1986
Monitoring of patient profiles	94.2%	94.4%
Drug utilization review	90.6	91.8
Monitoring drug interactions	90.3	91.2
In-service education	86.7	88.5
Drug information service	74.2	74.6
Consultation with physicians	67.8	67.9
Training programs	55.4	56.9
Pharmacokinetic service	33.6	32.7
Responding to CPR attempts	28.2	31.9
Patient discharge interview	15.3	16.8

Table 12 lists the services offered by hospital pharmacies and the frequency mentioned. Most services offered did not change significantly from 1986 to 1987. However, with the exception of pharmacokinetic services, mentions for each service declined during 1987. Pharmacists have suggested that budget considerations can sometimes force the discontinuation of one or more services.

Directors were asked to indicate the time allocated to the various services. The group that responded most often was general nonprofit hospitals with 300 beds or more, and data for this category follow:

Services	Pharmacist Hours/Week
Consultation with physicians	27
Drug information service	24
Pharmacokinetic service	20
Making rounds with physicians	17
Patient discharge interview	11
Patient admission interview	4

Most hospitals do not appear to dedicate a pharmacist to a specific service. Rather, they seem to incorporate several functions under the umbrella of clinical pharmacy to fill an FTE position.

Over 60% of all hospital pharmacies now use computers in some aspect of their operations. As Table 13 shows, patient billing seems to be the application most widely used. As hospitals increase in size, so does their reliance on computers. Hospitals with fewer than 200 beds use computers primarily for patient billing, patient profiles, and management reports. In addition to these applications, larger hospitals use computers for order transmission and inventory control. It is interesting to note that many directors now utilize personal computers to generate management reports they are called on to provide to their administration. Areas such as productivity, inventory control, patient billing, and price change updates can be managed by the director with such a personal computer. If hospital pharmacies continue to provide more services with either the same number of or fewer pharmacists, dependence on computers and ancillary personnel may increase.

Table 13 *Computer application according to bed capacity*

	Total	Under 50	50-99	100-199	200-299	300-399	400-499	Over 499
Patient billing	61.4%	44.1%	49.1%	62.8%	75.1%	74.7%	69.8%	56.5%
Order transmission	22.6	16.1	22.2	17.2	26.7	24.0	29.6	31.0
Patient profiles	49.9	19.1	31.2	46.7	64.2	67.8	64.8	74.1
Inventory control	23.5	13.1	17.4	20.5	28.0	32.2	23.9	37.5
Management report	49.4	28.8	38.9	46.2	57.0	63.5	60.4	65.3

FOR-PROFIT AND ANCILLARY OPERATIONS

Satellite pharmacy operations data were tabulated and are presented in Table 14. Generally, as hospitals increase in size, they are more likely to operate satellite pharmacies in conjunction with their main pharmacy operation. Specialized hospitals tend to operate more satellites and, therefore, require more pharmacists and technicians to staff them. General hospitals decreased the hours satellites were open during 1987, and specialized hospitals increased the hours of service. All categories showed an increase in personnel assigned to staff satellites. Interestingly, there seems to be no apparent trend regarding satellite operations.

Hospital pharmacies appear to be expanding their service base into for-profit areas, as indicated in Table 15. At least one in four specialized hospitals with over 499 beds operates a retail pharmacy. Profit and nonprofit hospitals alike seem to be looking to this area as an additional source of revenue. Almost 10% of all hospitals with under 300 beds now operate retail pharmacies. Next year the LILLY HOSPITAL PHARMACY SURVEY will survey the area of for-profit retail operations more extensively in order to gain more information on this area of hospital pharmacy operations.

Table 16 indicates involvement in another for-profit area of interest to hospital pharmacy managers—home health care. About 35% of specialized hospitals with over 500 beds are providing home-health-care services. The most frequently mentioned services provided were durable medical equipment and total parenteral nutrition.

Table 15 *Hospitals operating for-profit retail pharmacies*

General

Bed Capacity	Percent of Total
Under 299	8%
299-499	15
Over 499	10

Specialized

Bed Capacity	Percent of Total
Under 299	14%
299-499	20
Over 499	26

Table 14 *Satellite pharmacy operations*

General

Bed Capacity	Percent Operating Satellites	Percent of Pharmacies Operating Two or More Satellites	Hours Open/Week	Pharmacist Hours/Week	Technician Hours/Week
Under 299	13%	18%	43	43	37
300-399	28	57	49	49	24
400-499	51	62	60	60	41
Over 499	78	67	62	132	100

Specialized

Bed Capacity	Percent Operating Satellites	Percent of Pharmacies Operating Two or More Satellites	Hours Open/Week	Pharmacist Hours/Week	Technician Hours/Week
Under 299	19%	43%	67	91	21
300-399	51	43	75	88	73
400-499	51	59	67	84	52
Over 499	73	85	71	118	85

Table 16 *Hospitals operating for-profit home-health-care business and services offered*

General

Bed Capacity	Percent of Total	Durable Medical Equipment	Total Parenteral Nutrition	Oncology Therapy	Nutrition Counseling	Oxygen Service
Under 299	13%	68%	67%	56%	51%	63%
299 and Over	19	83	76	59	48	76

Specialized

Bed Capacity	Percent of Total	Durable Medical Equipment	Total Parenteral Nutrition	Oncology Therapy	Nutrition Counseling	Oxygen Service
Under 299	24%	71%	74%	69%	71%	74%
299-499	10	89	89	81	74	85
Over 499	34	90	87	73	77	83

Many hospital pharmacies that provide for-profit home-health-care services indicated that they did not specialize in one or two areas, but rather offered a number of options for their provider. One area that seems to have grown is the oncology therapy area.

Table 17 includes data on hospitals that operate outpatient pharmacies. Generally, in most bed capacity ranges, higher inventory and purchases levels were associated with pharmacies which provided outpatient pharmacy services. Overall, about 40% of responding pharmacies indicated the operation of an outpatient pharmacy. About two-thirds of those saying yes were specialized hospitals. About 45% of the nonprofit hospitals indicated they provided outpatient pharmacy services with half of the group in the 200-399 bed category. Essentially all of the federal hospitals responding indicated they provided outpatient pharmacy service.

Pharmacist hours worked were about 10% higher across all bed categories when outpatient pharmacies were operated. Technician hours worked also increased somewhat, but not as much percentage-wise as pharmacist hours.

A number of hospital pharmacies, interestingly, did not keep separate inventories for outpatient pharmacies. About 42% of the 300-399 bed hospitals responding (both general and specialized) indicated they kept separate inventories, and only 31% of the 100-199 bed hospitals indicated they had a separate inventory for the outpatient pharmacy. The number of outpatient pharmacies has grown across all bed categories surveyed over the last 3 years.

Table 17 *Hospital pharmacies operating outpatient pharmacies*

General

Bed Capacity	Average Inventory	Average Purchases	Pharmacist Hours/Week	Technician Hours/Week
Under 50	$ 27,519	$ 288,761	54	111
50-99	50,640	342,148	93	106
100-199	129,350	829,386	180	174
200-299	143,880	1,885,827	321	248
300-399	156,073	1,802,264	451	381
400-499	233,954	2,577,768	615	942
Over 499	n/a	n/a	1,077	939

Specialized

Bed Capacity	Average Inventory	Average Purchases	Pharmacist Hours/Week	Technician Hours/Week
200-299	$134,782	$1,333,092	382	318
300-399	210,578	2,419,925	655	538
400-499	269,766	2,866,865	749	626
Over 499	763,959	4,725,788	1,181	1,126

CONCLUSION

All indications are that 1987 was a year of "managed change" for many directors of pharmacy. Some pharmacy managers moved into for-profit areas to produce revenue; some added "high-technology" medications to inventory; and some dealt with newer diseases that require innovative therapies. It seems that the role of the pharmacy director is becoming increasingly diversified.

Hospital pharmacists may well become even more valuable to administrators as new revenue sources are sought to safeguard the economic viability of the institution. This new responsibility may be a challenge for pharmacies in smaller hospitals, which may lack either the manpower and capital resources or a market adequate to support a new venture. How hospitals adapt to new services and the need to generate new sources of revenue may be the key to their survival.

COMPARATIVE ANALYSIS WORK SHEET

If you wish to perform your own analysis, this work sheet may be useful to you.

It is most useful for both survey comparison and trend analysis to express operating statistics in terms of occupied beds or patient days.

If your pharmacy's operating data are affected by any of the variables that appear beneath each entry, adjust the comparative figure by consulting the appropriate table listed.

1. Hospital profile
   - General ☐
   - Specialized ☐
   - Other ☐
2. Bed capacity _____
3. Census _____ %
4. Beds occupied _____
   (multiply line 2 by line 3)
5. Patient days _____
   (multiply line 4 by 365)
6. Geographic location
   (see Table 5) _____

	Yes	No
7. Unit-dose system (90% of beds)	☐	☐
8. IV admixture service (90% of beds)	☐	☐

Operating Data	1987 Data	1986 Data	SURVEY Data (Comparable Category)
Inventory* (at cost)			
Use Table 9 for averages and Table 5 to adjust for geographic variation.	$	$	$
Refer to Table 10 if inventory includes IV fluids, irrigation solutions, or blood fractions.			
Per occupied bed or patient day	$	$	$
Purchases* (at cost)			
Use Table 9 for averages and Table 5 to adjust for geographic variation.	$	$	$
Refer to Table 10 if purchases include IV fluids, irrigation solutions or blood fractions.			
Per occupied bed or patient day	$	$	$
Estimated inventory turnover ratio†			
Use Table 9 for averages.	_____ times	_____ times	_____ times
Pharmacist hours worked per week			
Use Table 11 for averages.	_____ hours	_____ hours	_____ hours
Technician hours worked per week			
Use Table 11 for averages.	_____ hours	_____ hours	_____ hours
Pharmacy hours open per week			
Use Table 6 for averages.	_____ hours	_____ hours	_____ hours
Total annual payroll			
Use Table 11 for averages.	$	$	$
Pharmacy floor size			
Use Table 6 for averages.	_____ sq ft	_____ sq ft	_____ sq ft

*Include prescription drugs, IV fluids, irrigation solutions, and blood fractions, if normally in pharmacy's budget.

†Estimated inventory turnover ratio = $\frac{\text{Yearly purchases at cost}}{\text{Average inventory at cost}}$

PRODUCTIVITY WORK SHEET—May be calculated for any time period. However, weekly is indicated on this form.

Pharmacy Workload

Task	Standard Time Value (minutes)		Work Units Performed Weekly		Total Standard Time (minutes)
Unit dose	2.9	×		=	
Hyperalimentation	37.4	×		=	
Large-volume IV (additives)	6.4	×		=	
Small-volume IV (additives)	7.0	×		=	
Multidose prescriptions (inpatient, outpatient)	9.6	×		=	
Large-volume IV (w/o additives)	2.9	×		=	
Antineoplastic agents (inj.)	25.3	×		=	
				Total	

Total standard workload hours = $\frac{\text{total standard time (minutes)}}{60}$ = $\frac{\qquad}{60}$ = _____

Pharmacy Staff Hours

Pharmacy staff	Available hours weekly
Pharmacist (drug distribution)	
Pharmacist (management)	
Pharmacist (clinical practice)	
Technician (drug distribution)	
Support personnel	
	Total available hours weekly

Productivity indicator = $\frac{\text{total standard workload hours}}{\text{total available hours weekly}}$ = $\frac{\qquad}{\qquad}$ = _____*

*If the productivity indicator is less than 1, there is more pharmacy staff time available than the pharmacy workload requires, and the possibility of overstaffing exists. A productivity indicator figure of 1 suggests that pharmacy staff hours and workload are in balance. When the indicator figure exceeds 1, the pharmacy department is more productive than usual. Refer to Table 6, page 9, for comparative indicators.

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